



## Complete Summary

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### TITLE

Pediatric heart surgery: mortality rate.

### SOURCE(S)

AHRQ quality indicators. Guide to inpatient quality indicators: quality of care in hospitals -- volume, mortality, and utilization [revision 2]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2003 Sep 4. Various p. (AHRQ Pub; no. 02-R0204).

## Brief Abstract

### DESCRIPTION

This measure assesses the number of deaths per 100 discharged patients, age less than 18 years, who had heart surgery.

### RATIONALE

Pediatric heart surgery requires proficiency with the use of complex equipment, and technical errors may lead to clinically significant complications, such as arrhythmias, congestive heart failure, and death. Better processes of care may reduce mortality for pediatric heart surgery, which represents better quality care.

Pediatric heart surgeries range from fairly straightforward to rather complex procedures, and studies have noted that providers with higher volumes have lower mortality rates. This suggests that providers with higher volumes have some characteristics, either structurally or with regard to processes, that influence mortality.

### PRIMARY CLINICAL COMPONENT

Pediatric heart surgery; mortality

### DENOMINATOR DESCRIPTION

Discharges, age less than 18 years old, with an International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) procedure code for a specified heart surgery in any field, or any heart surgery and diagnosis of hypoplastic left heart syndrome in any field. Patients transferring to another short-term hospital, and Major Diagnostic Category (MDC) 14 (pregnancy, childbirth, and puerperium) are excluded. Refer to Appendix A of the original measure documentation for additional exclusions.

## NUMERATOR DESCRIPTION

Number of deaths with a code of pediatric heart surgery in any procedure field

### Evidence Supporting the Measure

## PRIMARY MEASURE DOMAIN

Outcome

## SECONDARY MEASURE DOMAIN

Not applicable

## EVIDENCE SUPPORTING THE MEASURE

One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

### Evidence Supporting Need for the Measure

## NEED FOR THE MEASURE

Wide variation in quality for the performance measured

## EVIDENCE SUPPORTING NEED FOR THE MEASURE

Hannan EL, Kilburn H Jr, O'Donnell JF, Bernard HR, Shields EP, Lindsey ML, Yazici A. A longitudinal analysis of the relationship between in-hospital mortality in New York State and the volume of abdominal aortic aneurysm surgeries performed. Health Serv Res 1992 Oct; 27(4):517-42. [PubMed](#)

### State of Use of the Measure

## STATE OF USE

Current routine use

## CURRENT USE

Internal quality improvement  
Quality of care research

### Application of Measure in its Current Use

## CARE SETTING

Hospitals

## PROFESSIONALS RESPONSIBLE FOR HEALTH CARE

Physicians

## LOWEST LEVEL OF HEALTH CARE DELIVERY ADDRESSED

Single Health Care Delivery Organizations

## TARGET POPULATION AGE

Age less than 18 years

## TARGET POPULATION GENDER

Either male or female

## STRATIFICATION BY VULNERABLE POPULATIONS

Unspecified

## Characteristics of the Primary Clinical Component

### INCIDENCE/PREVALENCE

Unspecified

### ASSOCIATION WITH VULNERABLE POPULATIONS

Unspecified

### BURDEN OF ILLNESS

Unspecified

### UTILIZATION

Unspecified

### COSTS

Unspecified

## Institute of Medicine National Healthcare Quality Report Categories

### IOM CARE NEED

Getting Better

## IOM DOMAIN

Effectiveness

### Data Collection for the Measure

#### CASE FINDING

Users of care only

#### DESCRIPTION OF CASE FINDING

All patients age less than 18 years old discharged from the hospital who had heart surgery

#### DENOMINATOR SAMPLING FRAME

Patients associated with provider

#### DENOMINATOR (INDEX) EVENT

Clinical Condition  
Institutionalization  
Therapeutic Intervention

#### DENOMINATOR INCLUSIONS/EXCLUSIONS

##### Inclusions

Discharges with an International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) procedure code for a specified heart surgery in any field, or any heart surgery and diagnosis of hypoplastic left heart syndrome in any field, and age less than 18 years old (see Appendix A of the original measure documentation for ICD-9-CM codes)

##### Exclusions

Patients transferring to another short-term hospital, and Major Diagnostic Category (MDC) 14 (pregnancy, childbirth, and puerperium) are excluded. Refer to Appendix A of the original measure documentation for additional exclusions.

#### NUMERATOR INCLUSIONS/EXCLUSIONS

##### Inclusions

Number of deaths with a code of pediatric heart surgery in any procedure field (see Appendix A of the original measure documentation for International Classification of Diseases, Ninth Revision, Clinical Modification [ICD-9-CM] codes)

##### Exclusions

Unspecified

#### DENOMINATOR TIME WINDOW

Time window is a single point in time

#### NUMERATOR TIME WINDOW

Institutionalization

#### DATA SOURCE

Administrative data

#### LEVEL OF DETERMINATION OF QUALITY

Not Individual Case

#### OUTCOME TYPE

Clinical Outcome

#### PRE-EXISTING INSTRUMENT USED

Unspecified

### Computation of the Measure

#### SCORING

Rate

#### INTERPRETATION OF SCORE

Better quality is associated with a lower score

#### ALLOWANCE FOR PATIENT FACTORS

Analysis by subgroup (stratification on patient factors)

Case-mix adjustment

Risk adjustment method widely or commercially available

#### DESCRIPTION OF ALLOWANCE FOR PATIENT FACTORS

Observed (raw) rates may be stratified by hospitals, age groups, race/ethnicity categories, sex, and payer categories.

Risk adjustment of the data is recommended using, at minimum, age, sex, and all-patient refined diagnosis-related groups (APR-DRG).

Application of multivariate signal extraction (MSX) to smooth risk adjusted rates is also recommended.

## STANDARD OF COMPARISON

External comparison at a point in time  
External comparison of time trends  
Internal time comparison

## Evaluation of Measure Properties

## EXTENT OF MEASURE TESTING

Each potential quality indicator was evaluated against the following six criteria, which were considered essential for determining the reliability and validity of a quality indicator: face validity, precision, minimum bias, construct validity, fosters real quality improvement, and application. The project team searched Medline for articles relating to each of these six areas of evaluation. Additionally, extensive empirical testing of all potential indicators was conducted using the 1995-97 Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases (SID) and Nationwide Inpatient Sample (NIS) to determine precision, bias, and construct validity. Table 1 in the original measure documentation summarizes the results of the literature review and empirical evaluations on the Inpatient Quality Indicators. Refer to the original measure documentation for details.

## EVIDENCE FOR RELIABILITY/VALIDITY TESTING

AHRQ quality indicators. Guide to inpatient quality indicators: quality of care in hospitals -- volume, mortality, and utilization [revision 2]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2003 Sep 4. Various p. (AHRQ Pub; no. 02-R0204).

## Identifying Information

### ORIGINAL TITLE

Pediatric heart surgery mortality rate.

### MEASURE COLLECTION

[Agency for Healthcare Research and Quality \(AHRQ\) Quality Indicators](#)

### MEASURE SET NAME

[Agency for Healthcare Research and Quality \(AHRQ\) Inpatient Quality Indicators](#)

### DEVELOPER

Agency for Healthcare Research and Quality

### ADAPTATION

Measure was not adapted from another source.

#### RELEASE DATE

2002 Jun

#### REVISION DATE

2003 Sep

#### MEASURE STATUS

Please note: This measure has been updated. The National Quality Measures Clearinghouse is working to update this summary.

#### SOURCE(S)

AHRQ quality indicators. Guide to inpatient quality indicators: quality of care in hospitals -- volume, mortality, and utilization [revision 2]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 2003 Sep 4. Various p. (AHRQ Pub; no. 02-R0204).

#### MEASURE AVAILABILITY

The individual measure, "Pediatric Heart Surgery Mortality Rate," is published in "AHRQ Quality Indicators. Guide to Inpatient Quality Indicators: Quality of Care in Hospitals -- Volume, Mortality, and Utilization." An update of this document is available in [Portable Document Format \(PDF\)](#) and a [zipped WordPerfect\(R\) file](#) from the [Quality Indicators](#) page at the Agency for Healthcare Research and Quality (AHRQ) Web site.

For more information, please contact the QI Support Team at [support@qualityindicators.ahrq.gov](mailto:support@qualityindicators.ahrq.gov).

#### COMPANION DOCUMENTS

The following are available:

- "AHRQ Inpatient Quality Indicators Software (Version 2.1 Revision 2)" (Rockville, [MD]: AHRQ, 2003 Sept 4) and its accompanying documentation can be downloaded from the [Agency for Healthcare Research and Quality \(AHRQ\) Web site](#). (The software is available in SPSS- and SAS-compatible formats.)
- Guidance for using the AHRQ quality indicators for hospital-level public reporting or payment. Rockville (MD): Agency for Healthcare Research and Quality; 2004 Aug. 24 p. This document is available from the [AHRQ Web site](#).
- "AHRQ Inpatient Quality Indicators - Interpretative Guide" (Irving [TX]: Dallas-Fort Worth Hospital Council Data Initiative; 2002 Aug 1. 9 p.) is available. This guide helps you to understand and interpret the results derived from the application of the Inpatient Quality Indicators software to your own data and is available from the [AHRQ Web site](#).

- "Refinement of the HCUP Quality Indicators" (Rockville [MD]: AHRQ, 2001 May. Various pagings. [Technical review; no. 4]; AHRQ Publication No. 01-0035) is available. This document was prepared by the UCSF-Stanford Evidence-based Practice Center for AHRQ and can be downloaded from the [AHRQ Web site](#).

## NQMC STATUS

This NQMC summary was completed by ECRI on December 4, 2002. The information was verified by the Agency for Healthcare Research and Quality on December 26, 2002. This NQMC summary was updated by ECRI on April 7, 2004.

## COPYRIGHT STATEMENT

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The logo for FIRSTGOV, with "FIRST" in blue and "GOV" in red, and a small red star above the "I".

